

Towards more sustainable exploitation of economic activities in the EEZ

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Introduction

Belspo project
quest4D
Ecosystem changes
Belgian part of the North Sea

= **QU**antification of
Erosion /
Sedimentation patterns to
Trace naturally from anthropogenically
induced *sediment dynamics*

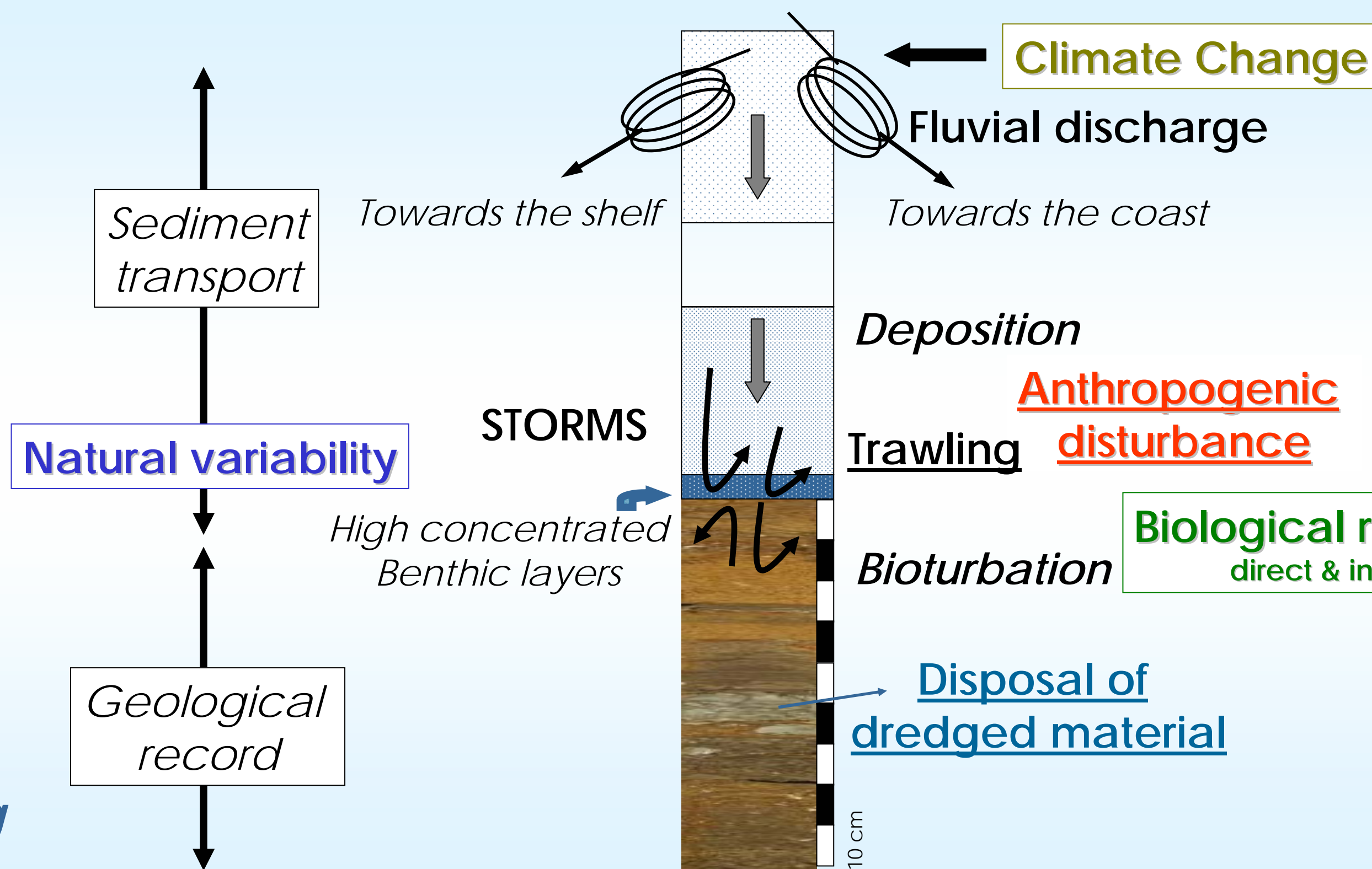
4D = 4 dimensions:
⇒ Space (x,y,z) AND Time (t)
(t) in Q4D:
°100 yrs
°Past 10-20 yrs
°yr-to-yr; seasonal; events

RESEARCH THEMES
Resume

Natural variability assessment

- Seabed erosion/deposition rates
- Fine sediment dynamics, and its relation to near bed processes
- Storm dynamics, *incl.* relation to formation of high concentrated benthic layers; as also sand transport
- Seasonal dynamics of turbidity maximum area in coastal zone
- Climate change

Based on measurements, mapping and modelling



Seabed Pressure assessment

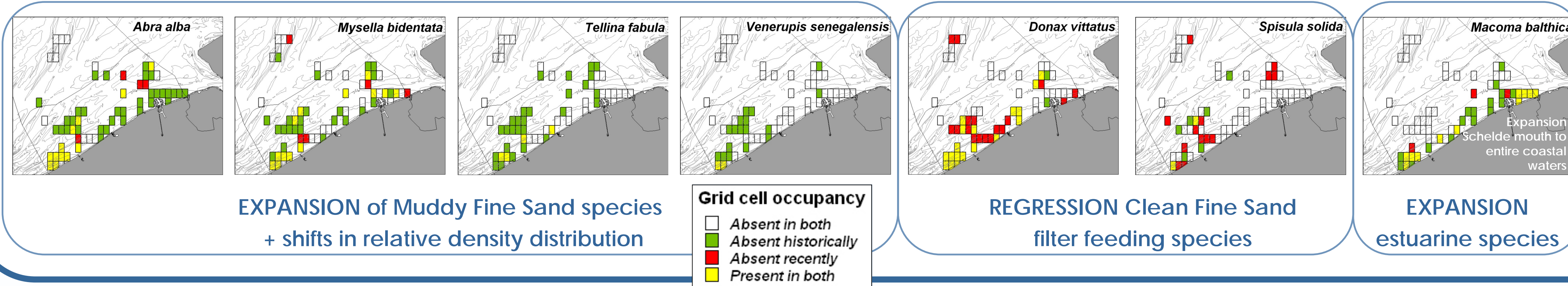
smothering (Sm); sealing (S); abrasion (A); extraction (E)

- Fishing Activities (A)
- Disposal of dredged material (S;A)
- Marine aggregate extraction (E;Sm)
- Infrastructure works s.l. (S;A)
- Beach nourishment (S;Sm)

Based on measurements, mapping and modelling

Main ecosystem impacts

Changes in the spatial distribution of bivalves in coastal waters (past 100 yrs)



- ⇒ Probable impact of change in fine sediment dynamics (increased turbidity?)
- ⇒ Probable effect of eutrophication / pollution: increased benthic biomass/productivity?

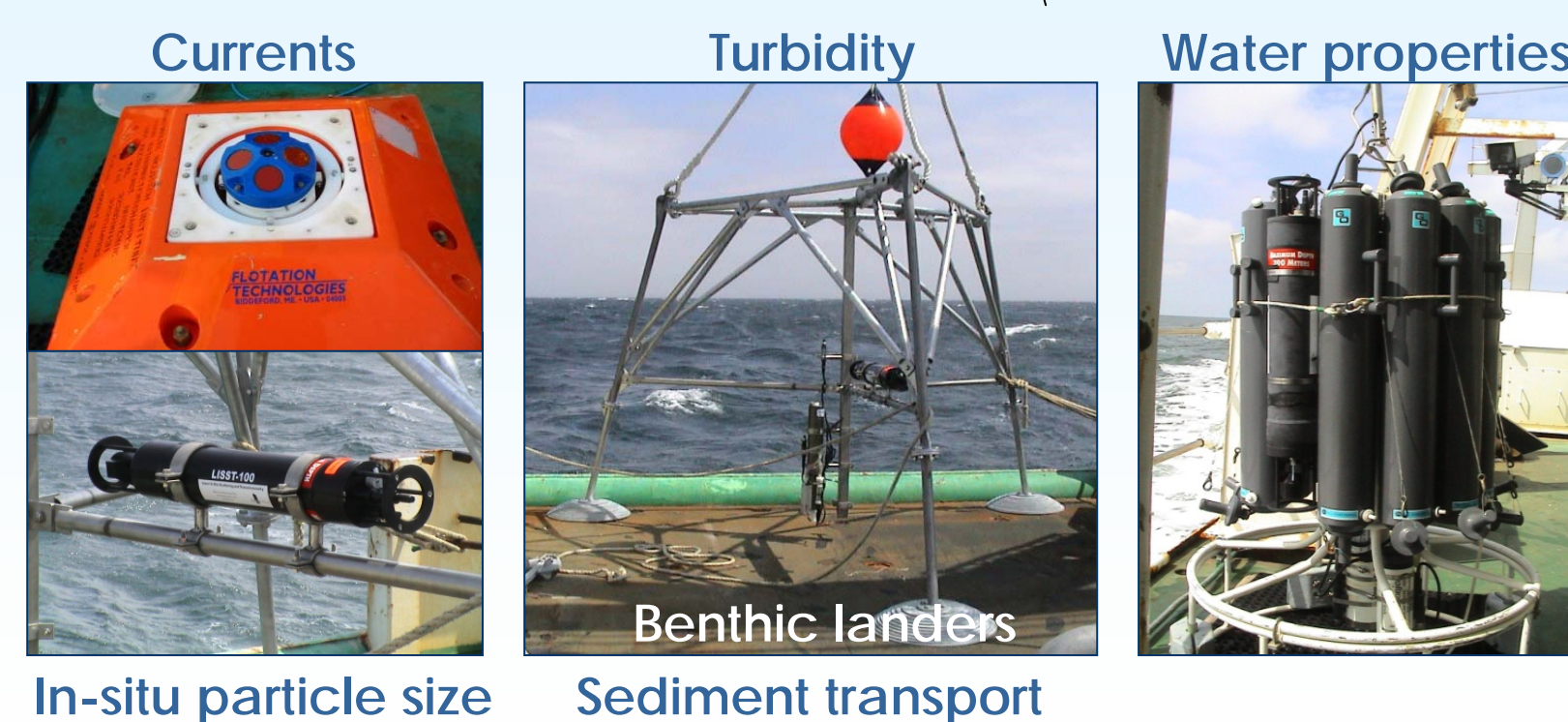
Sustainable exploitation – what is it?

1. Pressures do not hinder the ecosystem components to retain their natural diversity, productivity and dynamic ecological processes;
2. Recovery from perturbations must be rapid and secure, such that the attributes lie within their range of historical **natural variation**.

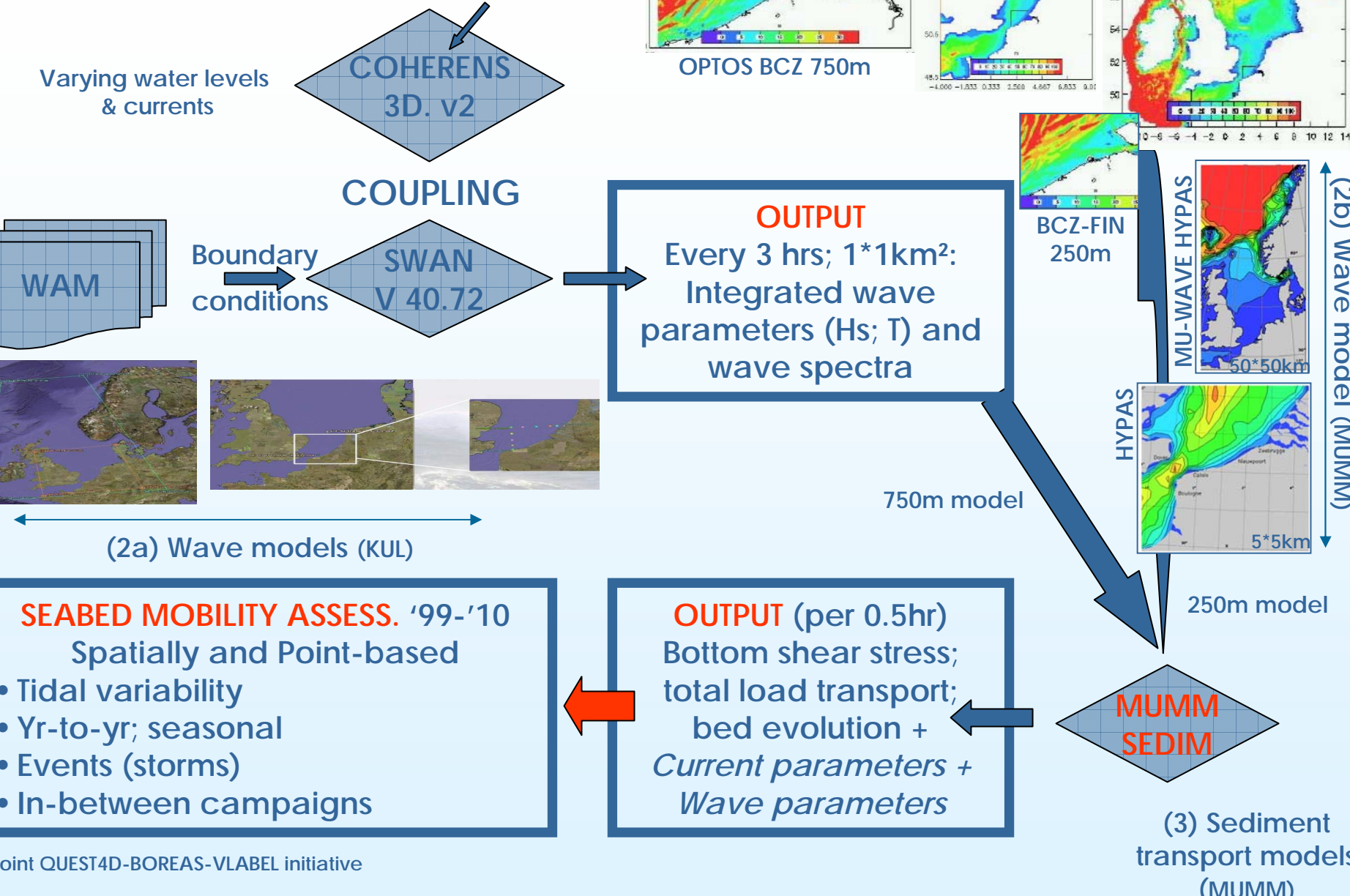
Recommendations w.r.t. European Marine Strategy Framework Directive

Natural variability assessment

MEASUREMENTS & MAPPING



MODELLING WORKFLOW



Integrated assessments, measurements, mapping and modelling:
HYPOTHESIS TESTING



A joint QUEST4D-BOREAS-VLIZ initiative

